

Appl. No. 10/065,960
Docket No. 125517/GEM-0071

REMARKS / ARGUMENTS

Status of Claims

Claims 1-10, 13-16, 18, 20-26, 29-35 and 37 are pending in the application. Claims 1-10, 13-16, 18, 20-26, 29-35 and 37 stand rejected. Applicant has amended Claims 21, 25 and 37 leaving Claims 1-10, 13-16, 18, 20-26, 29-35 and 37 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

Rejections Under 35 U.S.C. §102(b)

Claims 1, 7-10, 13-15, 18 and 20 stand rejected under 35 U.S.C. §102(b) as being anticipated by Schlager et al. (U.S. Patent No. 6,024,705, hereinafter Schlager).

Claims 16, 21, 24-26, 31, 34, 35 and 37 stand rejected under 35 U.S.C. 102(b) as being anticipated by Scanlon (U.S. Patent No. 5,853,005, herein after Scanlon).

Applicant traverses this rejection for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the *** claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). *Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference.* (emphasis added) *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

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Dependent claims inherit all of the limitations of the respective parent claim.

Regarding Examiner's Paragraph 2

In alleging anticipation of Claims 1, 10, and 18 by Schlager, the Examiner remarks "The signal from the accelerometer *is capable of gating*, which is described by the applicant as an option for characterizing different attributes of an organ for imaging." (emphasis added)[paper 20061107, page 2]

In respectful disagreement with the Examiner, Applicant finds Schlager to disclose "This invention relates to *seismic detection of myocardial ischemia secondary to coronary artery disease* and related measurement of cardiac performance parameters. Seismic measurement of chest wall vibrations using an accelerometer sensor mounted on the sternum, generates a waveform signal pattern... The seismocardiographic (SCG) waveform, which is the mechanical equivalent of electrocardiographic (ECG) waveform... The SCG waveform contains information that allows for the *noninvasive estimation of various cardiac performance parameters* such as ejection fraction (percentage of heart volume pumped on each stroke) and cardiac output (flow in liters per minute). This same SCG waveform also contains information on abnormal heart state conditions such as myocardial ischemia (or angina) ...a precursor of myocardial infarction (heart attack)..." [Schlager, col. 1, lines 7-26].

Here, Applicant finds Schlager to disclose and teach the use of an accelerometer for generating a SCG waveform *for estimating cardiac performance parameters* such as percentage of *heart volume pumped* on each stroke and *cardiac flow in liters per minute*, and to be completely absent any disclosure or teaching of the claimed "...utilizing the non-electrical sensor to acquire information for gating" as claimed for in Claim 1, and "...utilizing the non-electrical sensor to acquire information for cardiac gating" as claimed for in Claim 10.

In alleging anticipation, the Examiner alleges that "its is *known* that an accelerometer is an adaptable device" and that *Applicant acknowledges that* "the signal from an accelerometer is *capable of gating*, which is described by the applicant as an

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option for characterizing different attributes of an organ for imaging.” [Paper 20061107, page 2].

First, Applicant respectfully submits that an anticipation rejection based at least partially on the knowledge of one skilled in the art is contrary to 35 U.S.C. §102, which requires disclosure in a single prior art reference of each and every element of the claimed invention arranged as claimed. Absent such a disclosure, a prima facie case of anticipation cannot be established.

Second, Applicant respectfully submits that the Examiner has mischaracterized Applicant’s words by paraphrasing such words to read more into Applicant’s remarks than Applicant actually presents. At paragraph [0003], Applicant states “Gating is an option for characterizing different attributes of an organ for imaging”, which Applicant submits is different from the Examiner’s paraphrasing above where the Examiner stated “*Applicant acknowledges that* ‘the signal from an accelerometer is *capable of* gating, which is described by the applicant as an option for characterizing different attributes of an organ for imaging.’” At paragraph [0003], Applicant merely indicates that gating is an option for characterizing different attributes of an organ for imaging, and nowhere but in the disclosure of the invention itself does Applicant indicate that the signal from an accelerometer may be used for gating.

Third, Applicant respectfully submits that an anticipation rejection based at least partially on the *capability of* an accelerometer being used for gating is contrary to 35 U.S.C. §102, which requires disclosure in a single prior art reference of each and every element of the claimed invention arranged as claimed. Absent such a disclosure, a prima facie case of anticipation cannot be established. By applying a “capability” argument to reject the claimed invention under anticipation, it appears that the Examiner would apply an anticipation argument to reject all applications employing the signal of an accelerometer regardless of how that signal is used, simply because the accelerometer is *capable of* producing a signal useful for something. Applicant respectfully submits that such a rejection overreaches the bounds of anticipation, and therefore requests reconsideration and withdrawal thereof.

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Furthermore, in alleging anticipation of Claim 18, the Examiner remarks that it is "...known that an accelerometer is an adaptable device and is *fully capable of being arranged on a wrist* of a patient to yield information *for peripheral pulse gating*" (emphasis added) [paper 20061107, page 2] without specific direction as to where, within Schlager, such disclosure is present.

In view of the foregoing, it appears to Applicant that the Examiner is again relying on the "knowledge of one skilled in the art" to reject the claimed invention under anticipation, which Applicant submits is contrary to the requirements under 35 U.S.C. §102.

As such, Applicant submits that Schlager is absent disclosure of the claimed "...*utilizing the non-electrical accelerometer to acquire information for peripheral pulse gating*" as claimed for in Claim 18.

If the Examiner maintains the rejection of Claim 18 on grounds of anticipation, Applicant respectfully requests that the Examiner clearly identify where in Schlager each and every element arranged as claimed may be found.

For the foregoing reasons, Applicant submits that Schlager does not disclose each and every element of the claimed invention arranged as in the claim, and absent anticipatory disclosure in Schlager of each and every element of the claimed invention arranged as claimed, Schlager cannot be anticipatory.

Regarding Claim 7 More Specifically

To allege anticipation of Claim 7, the Examiner remarks "*Schlager et al. disclose a linear prediction coefficient determination function 11 in which the LPA coefficients are calculated for time segments of the SCG wave, preferably each segment is a heartbeat in length. This permits the SCG analysis instrument to be capable of determining timing of a gating signal prior to displacement of a body part of a patient.*" [paper 20061107, page 3.]

In respectful disagreement with the Examiner, Applicant finds Schlager to disclose "*The processed digital SCG signal is connected within the internal computer*

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program to a linear prediction coefficient determination function 11...This establishes SCG waveforms as a series of numerical LPA coefficients for processing of the total waveform for classification or for estimation purposes, by selection of the appropriate LPA coefficients..." (emphasis added) [Schlager, col 6, lines 1-12].

Here, Applicant finds Schlager to be directed to the establishment of SCG waveforms *for classification or estimation purposes*, and submits that Schlager is absent disclosure of the claimed "...*determining timing of a gating signal to be prior to displacement of a body part of a patient...*" as claimed for in Claim 7.

Not only does Applicant disagree that "capable of" language is appropriate for anticipation rejection, but also disagrees that Schlager discloses each and every element of the claimed invention arranged as claimed. Accordingly, Applicant submits that a prima facie case of anticipation has not been established.

Regarding Claims 9 and 15 More Specifically

To allege anticipation of Claims 9 and 15, the Examiner remarks "*The SCG waveform coefficients are processed in a pattern recognition process unit for classification...The pattern recognition technique is employed within a computer unit 9 for processing. Processing may include recording the patient's waveform and would, therefore, provide a training set within the computer database (col 6, lines 1-29; col. 8, lines 4-11"* [paper 20061107, page 3].

Applicant respectfully submits that the Examiner's application of Schlager, which *may include* certain claimed features, is completely contrary to the requirements of anticipation under 35 U.S.C. §102, submits that Schlager is absent disclosure of the claimed "...providing a training set within a database and employing a pattern recognition technique to extract a gating signal..." as claimed for in Claims 9 and 15, and respectfully submits that the Examiner has failed to specifically identify where in Schlager each and every element of the claimed invention *is disclosed* (as opposed to *may be disclosed*).

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Regarding Claim 13 More Specifically

To allege anticipation of Claim 13, the Examiner remarks "*Schlager et al. disclose a linear prediction analysis that includes calculating a first derivative ... While Schlager et al. do not specifically disclose a 'jerk' waveform or a 'salient peak', the mathematical modeling and computer processing is **capable of performing the function as claimed and would be anticipated (col. 12, lines 35-67; col 13, lines 1-39).**" (emphasis added) [paper 20061107, page 3].*

At the outset, Applicant notes that the Examiner acknowledges that Schlager is deficient in disclosing each and every element of the claimed invention arranged as claimed, but still applies an anticipation rejection based on what Schlager *may be capable of performing*.

Applicant respectfully disagrees that a *may be capable of* reference is a suitable reference for rejecting the claimed invention under 35 U.S.C. §102.

In addition, and in respectful disagreement with the Examiner, Applicant finds Schlager to disclose "*If E is to be minimized by appropriate choice of the a_k coefficients, then the partial derivative of E with respect to each coefficient a_j , $j=1,2,...,p$ should be zero...*" (emphasis added) [Schlager, col 13, lines 9-11].

From the very disclosure of Schlager (mathematical modeling involving the minimizing of E by appropriate choice of a_k coefficients, and the calculation of the partial derivative of E), it is unclear to Applicant how Schlager discloses "*...calculating a first derivative of the acceleration waveform to obtain a jerk waveform, determining a salient-peak of the jerk waveform, and utilizing the salient-peak as a trigger point for cardiac gating*", as claimed for in Claim 13, and respectfully submits that the Examiner has failed to establish a prima facie case of anticipation by failing to specifically identify where in Schlager each and every element of the claimed invention can be found.

Regarding Claim 20 More Specifically

To allege anticipation of Claim 20, the Examiner remarks "*Schlager et al. disclose an accelerometer and accelerometer output waveform, calculating a time delay*

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for information being transmitted from a heart of the patient to a peripheral pulse, and characterizing the signal. Specifically, phase integrity (lack of phase distortion) is important in a SCG waveform where time intervals contain primary information. Furthermore, there is an autocorrelation function whereby amplitude peak points are selected to determine the heart period and pulse rate. This method has been implemented in comparative testing in the output signal is characterized in a number of ways (col. 8, lines 64-67; col 10, lines 42-55; Fig. 2a)”

In respectful disagreement with the Examiner, Applicant finds Schlager to disclose “...a series of peak points on the modified autocorrelation function are picked and numbered...A subset starting with the largest amplitude peak points are then selected to determine the heart period and pulse rate...”, [Schlager, col 10, lines 42-44].

In view of the foregoing, and comparing Schlager with the claimed invention, Applicant finds Schlager to disclose obtaining a function of a seismocardiographic waveform and calculating heart period and pulse rate from peak amplitudes of the function, and to be absent disclosure of the claimed “...obtaining an acceleration waveform from the accelerometer, calculating a time delay for information being transmitted from a heart of the patient to a peripheral pulse, and characterizing the signal...” as claimed for in Claim 20.

If the Examiner maintains the rejection of Claim 20 on grounds of anticipation, Applicant respectfully requests that the Examiner clearly identify where in Schlager each and every element arranged as claimed can be found.

In view of the foregoing remarks, Applicant submits that Schlager does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner’s rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

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Regarding Examiner's Paragraph 3

Regarding Claim 16

In alleging anticipation of Claim 16, the Examiner remarks "*Scanlon discloses a sound and movement monitor suitable for providing the capability to locally or remotely monitor living organism body functions...The system as described is, therefore, capable of being utilized for gating for a medical imaging system. The transducer may be a force, or pressure transducer that provides an output proportional to pressure changes (col. 2, lines 35-44).*" (emphasis added) [paper 20061107, page 4]

Here, it appears that the Examiner is equating pressure with force. The Examiner finds Scanlon to disclose a sound and movement monitoring system, but then broadly construes that *measurement based on pressure* is somehow the same as *measurement based on force*.

Applicant finds Scanlon to disclose "*In a preferred embodiment, the sensor pad is liquid-filled with a pressure transducer ...*" [Scanlon col. 2, lines 30-32], and submits that Scanlon is absent disclosure of the claimed "*...selecting a non-electrical sensor, the non-electrical sensor being a force sensor; and, utilizing the non-electrical sensor to acquire information for gating.*"

By alleging, for purposes of anticipation, that pressure is the same as force, the Examiner has stretched the disclosure of Scanlon beyond its permissible limits, since a reference cannot be anticipatory if it fails to disclose each and every element of the claimed invention arranged as claimed.

Regarding Claim 21

Applicant has amended Claim 21 to now recite, inter alia: "*...a non-electrical sensor from a group consisting of a force sensor, ultrasonic sensor, strain gage, and an interferometer resting on a vibrating surface...*". No new matter has been added, as antecedent support may be found in the originally filed application, such as originally filed Claim 21, for example.

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In alleging anticipation of Claim 21, the Examiner remarks "...The transducer may be a force, or pressure, transducer that provides an output proportional to pressure changes (col. 2, lines 35-44). Furthermore, it may be a vibratory and /or movement sensor, such as an accelerator [accelerometer], a strain gage, an optical displacement sensor, a fiber-optic sensor, or a chemical, biological, and electrical emission sensor (col. 2, lines 2-8)." [paper 20061107]

Applicant finds Scanlon to disclose "...For example, the transducer could be a vibratory and/or movement sensor, such as an accelerometer, a strain gage, an optical displacement sensor, or a fiber-optic sensor..." [Scanlon, col. 2, lines 2-6]. Applicant respectfully submits, as set forth above, that disclosure of a pressure sensor is not disclosure of a force sensor, and further submits that Scanlon is absent disclosure of the now claimed "...a non-electrical sensor from a group consisting of a force sensor, ultrasonic sensor, and an interferometer resting on a vibrating surface..."

Accordingly, Applicant submits that Scanlon does not disclose each and every element of the claimed invention arranged as in the claim, and absent anticipatory disclosure in Scanlon of each and every element of the claimed invention arranged as claimed, Scanlon cannot be anticipatory.

Regarding Claim 25

Applicant has amended Claim 25 to now recite, inter alia: "...utilizing the non-electrical accelerometer to acquire information for gating...". No new matter has been added, as antecedent support may be found in the originally filed application, such as the originally filed claims, for example.

Applicant finds Scanlon to disclose "...a passive non-invasive acoustic and movement monitor suitable for simply and remotely providing body function monitoring..." [Scanlon, col. 1, lines 35-37], and submits that Scanlon is absent the now-claimed "...utilizing the non-electrical accelerometer to acquire information for gating..." as claimed for in Claim 25.

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Regarding Claim 37

Applicant has amended Claim 37 to now recite, inter alia: "...utilizing the non-electrical accelerometer to acquire information for gating". No new matter has been added, as antecedent support may be found in the originally filed application, such as the originally filed claims, for example.

Applicant finds Scanlon to disclose "...a passive non-invasive acoustic and movement monitor suitable for simply and remotely providing body function monitoring..." [Scanlon, col. 1, lines 35-37], and submits that Scanlon is absent the now-claimed "...utilizing the non-electrical accelerometer to acquire information for gating..." as claimed for in Claim 37.

In view of the foregoing amendments and remarks, Applicant submits that Scanlon does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(b) has been traversed, and requests that the Examiner reconsider and withdraw this rejection.

Rejections Under 35 U.S.C. §103(a)

Claims 2-6, 22-23, 29-30 and 32-33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Schlager in view of Scanlon.

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that the obviousness rejection based on the References is improper as the References fail to teach or suggest each and every element of the instant invention in such a manner as to perform as the claimed invention performs. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are taught or suggested in the prior art. MPEP §2143.03.

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Dependent claims inherit all of the limitations of the respective parent claim and any intervening claim.

Regarding Examiner's Paragraph 5

Regarding Claims 2-6, 32, and 33

The Examiner acknowledges that Schlager does not disclose each and every element of the claimed invention, and looks to Scanlon to cure the deficiencies of Schlager.

In view of the claims under Examiner's Paragraph 5 being dependent claims, Applicant not only agrees that Schlager is deficient in teaching each and every element of the claimed invention, but that Schlager is also deficient in disclosing each and every element of the respective parent claim, as set forth above, and that Scanlon, as cited by the Examiner to reject the subject dependent claims is deficient in curing the core deficiencies of Schlager with respect to the parent claims. Accordingly, absent a teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs, a prima facie case of obviousness cannot be established.

For at least the reasons set forth above regarding the patentability of the parent claims, Applicant submits that the dependent claims under Examiner's Paragraph 5 are patentable because Scanlon fails to cure the deficiencies of Schlager with respect to a teaching or suggestion of each and every element present in the parent claims.

Regarding Claims 22, 23, 29 and 30 More Specifically

The Examiner acknowledges that Scanlon does not disclose each and every element of the claimed invention, and looks to Schlager to cure the deficiencies of Scanlon.

In view of the claims under Examiner's Paragraph 5 being dependent claims, Applicant not only agrees that Scanlon is deficient in teaching each and every element of the claimed invention, but that Scanlon is also deficient in disclosing each and every

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element of the respective parent claim, as set forth above, and that Schlager, as cited by the Examiner to reject the subject dependent claims is deficient in curing the core deficiencies of Scanlon with respect to the parent claims. Accordingly, absent a teaching or suggestion of each and every element of the claimed invention arranged so as to perform as the claimed invention performs, a prima facie case of obviousness cannot be established.

For at least the reasons set forth above regarding the patentability of the parent claims, Applicant submits that the dependent claims under Examiner's Paragraph 5 are patentable because the Schlager fail to cure the deficiencies of Scanlon with respect to a teaching or suggestion of each and every element present in the parent claims.

In view of the foregoing, Applicant submits that the References fail to teach or suggest each and every element of the claimed invention and are therefore wholly inadequate in their teaching of the claimed invention as a whole, and therefore cannot properly be used to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and withdrawal of all rejections under 35 U.S.C. §103(a), which Applicant considers to be traversed.

In light of all of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

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If a communication with Applicant's Attorneys would assist in advancing this case to allowance, the Examiner is cordially invited to contact the undersigned so that any such issues may be promptly resolved.

The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845. In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

CANTOR COLBURN LLP

Applicant's Attorneys

By: 

David Arnold
Registration No: 48,894
Customer No. 23413

Address: 55 Griffin Road South, Bloomfield, Connecticut 06002
Telephone: (860) 286-2929
Fax: (860) 286-0115